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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,708	07/17/2003	Ju-Hyun Nam	SEC.1060	9310
20987	7590	09/29/2005	EXAMINER	
VOLENTINE FRANCOS, & WHITT PLLC ONE FREEDOM SQUARE 11951 FREEDOM DRIVE SUITE 1260 RESTON, VA 20190			HUSBAND, SARAH E	
			ART UNIT	PAPER NUMBER
			1746	

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/620,708

Applicant(s)

NAM, JU-HYUN

Examiner

Sarah E. Husband

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 7/17/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

The basis of the election of species has been reconsidered and the requirement for the election of species has been withdrawn. All claims have been included in the search.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless – (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshioka (US Patent Application Publication 2002/0027080 A1).

Yoshioka discloses a plating apparatus for dipping wafers into an internal tank having an external overflow tank with a recirculation line (Fig. 1, Items 315, 316, C1), a drying unit (paragraph 37), a substrate-transferring device (robot arm) (Fig. 3A, Item 22), and a gas-concentration unit which would read on a bubble detector because dissolved gas would be considered a bubble in its most basic form (paragraphs 82-87, Item 340), and also has a control unit (paragraph 81).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1746

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitano (US Patent Application Publication 2002/0124798 A1) in view of Schiele (US Patent No. 5,931,173).

Kitano discloses a film-forming unit, which has a cleaning process as well. Kitano discloses having a drying unit (paragraph 52), a wafer carrier (robot arm) (paragraph 48 and 49), a bubble-detecting sensor (paragraph 18, 66 and 67) associated with the chemical line, and a controller (paragraph 79). The containers (tanks) having an open top (Items 61 and 62, paragraphs 56, 57) are kept in a solvent atmosphere where the wafer is treated and would be considered a chemical bath. Kitano also discloses using a light emitting and receiving element as a detector (paragraph 66). Schiele discloses a wafer dipped in a chemical tank with a monitor (bubble detecting sensor) associated with the tank.

Kitano does not specifically disclose three different types of bubble detecting devices. However, Kitano does disclose that any type of sensor capable of detecting the presence of air bubbles from a difference between physical properties of gas and liquid may be used (paragraph 86). Schiele discloses using a type of sensor that monitors vibrations and also a photosensor. The Applicant also discloses in the specification that the detectors, photo, optical and vibration, are known and are readily applicable (paragraph 85). Therefore, to one of ordinary skill in the art it would be obvious to utilize any of these sensors as they would provide the same function of detecting bubbles and the substitution of known equivalent

structures was found to be obvious, *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Sushi* 169 USPQ423 (CCPA 1971).

Claims 5-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitano and Schiele as applied to claims 1-4 above, and further in view of Yoshioka.

Kitano and Schiele disclose the apparatus shown above in the 103(a) rejection. Kitano and Schiele do not disclose an overflow tank in use with a wafer processing apparatus. Yoshioka discloses an overflow tank and also a chemical circulating line associated with the tank. Kitano does disclose that the photosensor has a part that is transparent to allow the light to pass through which would enable the sensor to operate properly (paragraph 66). They do not specifically disclose having a transparent vessel wall, however, in order for a photosensor to work properly, it would be obvious to one of ordinary skill in the art to provide a transparent wall of some area in order for light to penetrate the device wherever the device may be located. As is shown by Schiele (col. 7), the device can be associated with the tank or as shown by Kitano and Yoshioka, the device can be shown in the circulating line. At the time of the invention, it would be obvious to one of ordinary skill in the art to provide a sensor in both the circulating line and the tank to provide information about the amount of bubbles found both in the fluid being sent to the tank and also on the substrate and also use a dipping and overflow tank as shown by Yoshioko for the benefit of the bubbles being able to escape easily (paragraph 10).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art not referred to are Nanbu (US 5,565,034 and 6,054,181), Minami (US 6,238,109), Chu (US 6,425,497), Chan (US 2002/0064604) and Murayama (US 2003/0042632), who teach wafer treatment apparatus having bubble detectors.

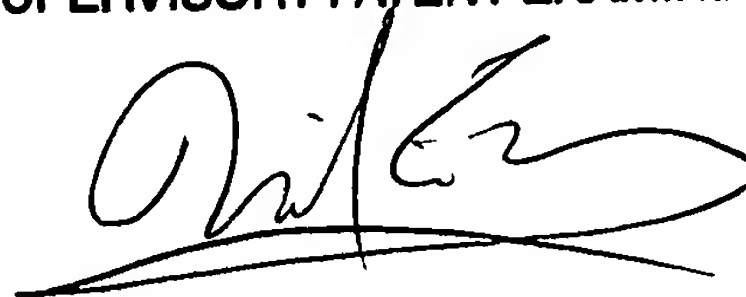
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah E. Husband whose telephone number is (571) 272-8387. The examiner can normally be reached on M-F 7:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael E. Barr can be reached at (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SEH

**MICHAEL BARR**  
**SUPERVISORY PATENT EXAMINER**

A handwritten signature in black ink, appearing to read 'Michael Barr', with a long horizontal flourish underneath.